WEST

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L10: Entry 2 of 2 File: USPT Sep 9, 2003

DOCUMENT-IDENTIFIER: US 6617490 B1
TITLE: Absorbent articles with molded cellulosic webs

Brief Summary Text (30):
Various types of thermosetting binders are known to the art such as polyvinyl acetate, vinyl acetate, ethylene-vinyl chloride, styrene butadiene, polyvinyl alcohol, polyethers, and the like, as well as elastomeric latex emulsions. Representative thermosetting binder materials which are adapted for application in the form of a liquid dispersion include copolymers of ethylene and acrylic acid, vinyl acetate-ethylene copolymers, acrylonitrile-butadiene copolymers, vinylchloride polymers, vinylidene chloride polymers, curable acrylic latex compositions, "Airflex" available from Air Products & Chemicals, P.O. Box 97, Calvert City, Ky. 42029, and the like. Latex that does not become crosslinked can be useful in producing an absorbent article that is also flushable after use. For example, commercial latex sources can be used, wherein a crosslinker is present, without causing significant crosslinking if the temperature of curing is kept below a designated temperature (e.g., below 130.degree. C. for many latices), or if the pH is kept at a level incompatible with latex crosslinker (e.g., a pH of 8 or above, more specifically 8.5 to 10.8). Alternatively, a crosslinking inhibitor could be added to preclude crosslinking, even when heated. Sodium bicarbonate, for example, can be a useful crosslinking inhibitor. Also alternatively, latex can be prepared with substantially no crosslinker present (typically NMA), such that a water-dispersible film can form upon drying which can provide strength in the dry state and a reduced degree of strength when moistened, with the possibility of rapid break up when flushed.

Brief Summary Text (33):
Polycarboxylic acids can also be used as thermally curable binder materials. For example, commonly owned U.S. Pat. No. 6,322,665, "Patterned Application of Polymeric Reactive Compounds to Fibrous Webs," filed Oct. 25, 1999 by Sun and Lindsay, herein incorporated by reference in its entirety, discloses polymeric anionic reactive compounds which can be applied to cellulosic webs to cause crosslinking between the fibers for good strength and bonding. The polymeric reactive compound can be a polymer such as a copolymer, terpolymer, block copolymer, homopolymer, or the like, comprising a monomer with carboxylic acid groups on adjacent atoms (particularly adjacent carbon atoms) that can form cyclic anhydrides in the form of a 5-membered ring, with maleic acid or its derivatives representing specific embodiments of such a monomer. Copolymers of maleic acid or maleic anhydride are thus useful polymeric reactive compounds. Polyacrylic acid can be formed to be useful for the present invention if a significant portion of the polymer comprises monomer that are joined head to head rather than head to tail, to ensure that carboxylic acid groups are present on adjacent carbons. Copolymers of maleic acid or anhydride with acrylic acid or its derivatives are also useful polymeric reactive compounds. A useful commercial compound comprising polycarboxylic acids suitable for bonding fibers in an airlaid web is BELCLENE.RTM. DP80 from FMC Corporation, which is a terpolymer of maleic acid, vinyl acetate, and ethyl acetate.

Detailed Description Text (16):
The backsheet 74 is generally impervious to liquids and, thus, prevents menstrual fluid or other body exudates which may be released from the absorbent core 90 from soiling the body or clothing of the user. Any backsheet material used in the art for

such purposes can be utilized herein. Suitable materials are embossed or nonembossed polyethylene films and laminated tissue, optionally treated with sizing agents and wet strength agents. Breathable films that permit moisture transpiration to occur without significant condensation can also be used. The backsheet 74 may be embossed or provided with odor-controlling materials. The backsheet 74 may also be made of a soft, cloth-like material which is hydrophobic relative to the topsheet 72. An exemplary cloth-like backsheet material is a laminate of a polyester nonwoven material and a film such as is described in U.S. Pat. No. 4,476,180 issued to Wnuk on Oct. 9, 1984. The backsheet can be a polyethylene film having a thickness of from about 0.012 mm to about 0.051 mm. Electrospinning can also be used to create fine denier fibers in an assembly that is breathable but liquid impervious. The backsheet 74 and other components may be biodegradable and/or flushable.

Detailed Description Text (36):
The heated air section 152 of the hood 150 could also provide steam instead of heated air alone for molding of the web. Steam can be used to soften a material and increase its moldability, and is beneficial for certain binder materials that require moisture. For example, steam could soften and/or swell a binding agent such as VINNEX.RTM. Dry Emulsion Powder (DEP) binders of Wacker Polymer Systems (Burghausen, Germany), leading to improved bonding with the latex-based binders. In one embodiment, steam treatment equipment is used as disclosed in U.S. Pat. No. 5,968,430, issued Oct. 19, 1999 to M. Naito et al., in which foamed particles are fused together as steam contacts an article. DEP binders can be deposited in an airlaid web during or after production of the web and later activated with moisture prior to or during molding, followed by drying and curing of the binder material. When curing of a latex or other crosslinkable binder material is desired, the web temperature during curing can be about 130.degree. C. or higher, more specifically 150.degree. C. or higher, more specifically still about 160.degree. C. or higher, and most specifically from about 140.degree. C. to about 200.degree. C. In some cases, the degree of crosslinking can be limited for improved flexibility or water dispersibility of the product by restricting the peak temperature of the web. For example, drying and/or curing may be conducted at temperatures not exceeding 180.degree. C. , more specifically not exceeding 160.degree. C. , more specifically still not exceeding 140.degree. C. , and most specifically not exceeding 120.degree. C.